Office Action Summary	Application No.	Applicant(s)	
	10/576,278	HABUTA ET AL.	
	Examiner	Art Unit	
	ANNA L. VERDERAME	1795	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *23 October 2009*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *25-29,31 and 32* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *25-29,31 and 32* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *18 April 2006* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☒ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

The finality of the office action mailed on 12/29/2009 has been withdrawn.

Claim Rejections - 35 USC § 103

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

2. Claims 25, 27-29 rejected under 35 U.S.C. 103(a) as being unpatentable over by Uno et al. WO 2004/027770(US 2005/0253210 used as an English language translation).

See medium number 2 in tables 1 and 2. Medium number 2 is a four layer optical recording medium having recording layers containing Te, O, and Pd. In medium number 2 the first recording layer/the layer nearest the light incidence plane has a compositional ratio of Pd which is 1% greater than that found in the second recording layer (see table 2). In this example the first recording layer corresponds to applicant's nth recording layer because it is the layer nearest the light incidence plane. Disclosure is found on pages 20-25 of the WO document and in sections 0071-0076 of the US document.

With regard to claim 27 thicknesses of the recording layers in medium 2 are taught in table 1.

With regard to the limitation of claim 28, the examiner notes that both applicant and Uno et al. form the protective layers of 80:20 $ZnS\text{-}SiO_2$. Therefore, the protective layers in Uno et al. inherently exhibit a refractive index of at least 1.5.

With regard to the limitation of claim 29 it is the position of the examiner that the Al-Cr reflective layer used in media number 2 taught by Uno et al. will inherently possess a refractive index of no more than 2 and an extinction coefficient of at least 2 based on the disclosure to use similar materials for the reflective layer on page 10 of the applicant's specification.

With regard to the limitation recited in claim 25 which requires that the compositional ratio of M in the layer nearest the light incidence plane be at least 2% greater that that in the next closest layer to the light incidence plane, the examiner notes that the difference of 1% exemplified by Uno et al. is very close to but does not overlap or touch the claimed range.

With regard to the composition of the recording layers, Uno et al. recites at (0021-0022) that among other things it is preferable that the concentration of M atoms in the first recording layer be higher than that in the second through M-th recording layer(emphasis added).

Further, in a dual layer embodiment shown in figure 2 the recording layer nearest the light incidence plane has a metal concentration of 10.3% and the recording layer further from the light incidence plane has a metal content of 5%(0093-0100). This is a difference of 5.3% between the nth and n-1th recording layers.

It would have been obvious to one of ordinary skill in the art at the time of the invention to modify the multilayer medium disclosed in table 1 wherein the metal content is varied by 1% in each successive layer and the layer nearest the light incidence plane has the highest metal concentration by varying the metal concentration between successive layers by 5% as illustrated in the dual-layer medium of embodiment two and based on the disclosure at (0021-0022) that the concentration of M atoms in the first recording layer is to be higher than that in the second through mth recording layer. This modification can be done with the reasonable expectation of success based upon the example in which the metal content is varied by 5.3% and the disclosure found at (0021-0022) which directs one to vary the metal content so that the content of the second through mth layers is less than that of the first recording layer. .

3. Claim 31 is rejected under 35 U.S.C. 103(a) as being unpatentable over Uno et al. WO 2004/027770(US 2005/0253210 used as an English language translation) in view of Kitaura et al. US 2002/0022105 and Yasuda et al. US 6,221,455.

Uno et al. discloses a four layer optical recording layer having recording layers which contain Te, O, Pd wherein the metal concentration in the recording layer nearest the light incidence plane is 1% greater or 5% greater than that in the next closest layer to the light incidence plane. Uno et al. does not disclose the limitations of claim 31.

Kitaura et al. 2002/0022105 teaches a single layer optical recording media in figures 1-2 comprising a Te,O,M recording layer 3 and a dielectric layer 2. The dielectric layer can be placed on either side of the recording layer 3(0037). Figure 3 teaches a

dual-layer optical recording layer comprising a first information layer 7, a separation layer 8, a second information layer 9 and a protective layer 4. Here at least the first information layer 7 or the second information layer 9 comprises a dielectric layer 2 and a recording layer 3(0038). Media having 2 to six layers can be formed(0027). A four layer medium is shown in figure 7(emphasis added).

The dielectric layer 2 is made of a material having a refractive index not less than 1.5. Examples of materials for the protective layer include ZnS, TiO_2, ZrO_2, Si, SiC, Si_3N_4, GeN or the like as the main component is suitable. Depending on the wavelength and the optical constant of each layer, it is preferable to determine the thickness to be in the range between $0.31\lambda/n$ and $0.5\lambda/n$ where in a wavelength of an optical beam used for recording and reproduction is λ and a refractive index of the dielectric layer 2 is n(0040).

The wavelength used for recording is not more than 500 nm(0028). N is preferably 2.5 or more(0040). If a wavelength of 400 nm is used for recording and the refractive index of the protective layer is 2.5 than the minimum thickness for the recording layer $0.31\lambda/n$ is 48 nm and within the range taught in claim 6.

As the material for the recording layer a material containing Te, O, and M wherein M is one or more elements selected from Al, Si,Ti, V, Cr, Mn, Fe, Co, Ni, Cu, Zn, Ga, Ge, Zr, Nb, Mo, Ru, Rh, Pd, Ag, In, Sn, Sb, Hf, Ta, W, Re, Os, Ir, Pt, Au, and Bi can be used. It is preferable that M is Pd or Au since a sufficient crystallization speed and high environmental stability can be obtained(0041). A preferable composition range for the recording layer 3 is from 25 to 60 atomic percent for O-atoms and from 1

to 35 atomic percent M-atom(0042). The recording layer has a thickness in the range of 5 nm to 70 nm(0029).

The reference discusses the results caused by adjusting the O-atom concentration and the M-atom concentration respectively (0043-0044). In an area where the O-atom in the recording layer is contained in an amount of 25 atomic percent or less a thermal conductivity of the layer is too high so that recording marks become too large. Thus even if the recording power is enhanced the C/N ratio does not rise. On the other hand in an area where the O-atom concentration in the recording layer exceeds 60 atomic percent, a thermal conductivity of the recording layer becomes too low so that recording marks cannot be formed large enough even by enhancing the recording power. Thus the C/N ratio is low and the sensitivity also is insufficient(0043). In an area where M-atom in the recording layer 3 is contained at less than 1 atomic percent the function of promoting crystal growth is low and the crystallization speed in the recording layer is insufficient so that marks can not be formed at a high recording speed. On the other hand in an area where the M-atom concentration exceeds 35 atomic percent a reflectance change between the amorphous and the crystalline phase deteriorates so that the C/N ratio is low(0044).

In regard to the limitation of instant claim 31 which requires annealing of the recording layer at a temperature of 60°C or higher for at least five minutes after the recording layer had been formed, this limitation is taught in Kitaura et al at (0013).

It would have been obvious to anneal the recording layers in medium number 2 taught by Uno et al. by heating the recording layers at a temperature of 60°C or higher

for at least 5 minutes after the recording layers have been formed based on the example of Kitaura et al. and with a reasonable expectation of success based on the similarities between the media taught by Uno et al. and Kitaura et al.

Response to Arguments

4. Rejections Under 35 U.S.C. 112 second paragraph: These rejections have been withdrawn due to applicant's amendment of the claims.

5. Rejections under 35 U.S.C. 102(b): This rejection has been withdrawn.

6. Rejection under 35 U.S.C. 103(a): The rejection of claim 31 has been maintained. However, applicant's arguments regarding claims 26 and new claim 32 are persuasive. While the Uno et al. reference discloses a medium where the amount of M in a layer further from the light incidence plane is at least 1% greater than that in an adjacent layer nearer the light incidence plane and discloses that the metal content can be varied from 1-35% , the reference does not disclose changing the metal content in the layer further from the light incident plane to be 4 atom % or 5 atom % greater respectively than that in a layer nearer the light incident plane.

Conclusion

7. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the

shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to ANNA L. VERDERAME whose telephone number is (571)272-6420. The examiner can normally be reached on M-F 8A-4:30P.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Cynthia Kelly can be reached at (571) 272-1526. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Anna L Verderame/

Examiner, Art Unit 1795

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